STEERING SYSTEM SERVICE

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INTRODUCTION

This video will explain how to properly diagnose and repair common steering system troubles. Steering system components such as bail sockets, the steering column, steering rack assembly, power steering pump, power steering belt, hoses, seals and other parts can eventually malfunction after extended service. For the customer's safety, it is important that the steering be kept in perfect condition. A successful automotive technician will be able to find and correct steering system problems quickly and efficiently. This tape summarises the basic procedures used to maintain and repair modem steering systems. use this program as a reference in your future studies in auto mechanics.

STUDENT OBJECTIVES

After viewing this video, the student will be able to:

.Properly inspect an automotive steering system for problems.
.Explain the purpose of a dry park test.
.Describe the components of a rack and pinion steering system.
.Explain how a rack and pinion steering system operates.
.List the components of a linkage type steering system.
.Describe how a linkage type steering system works.
.Explain the differences between a linkage type steering system and a rack and pinion steering system.
.Describe how a basic power steering system operates.
.Explain the function of a power steering pump.
.Properly troubleshoot and repair certain steering system malfunctions.

TO THE INSTRUCTOR

This video is designed to be a valuable supplement to your curriculum. Since young people are extremely acclimated to television, it is a natural way to help present important aspects of your subject matter. This video is designed to give a detailed, yet broad coverage of the topic.

Most educators agree that it is best to use as many instructional methods as possible. Utilise quality textbooks, workbooks, videos, lectures, demonstrations, overheads, and other methods to present the technical information. This will hold interest and help pupils understand the large amount of information required to succeed in today's complex world.

This video is organised into major sections or topics. Each section covers one major segment of the subject. Graphic breaks are given between each section so that you can stop the video for class discussion, demonstrations, to answer questions, or to ask questions. This allows you to only watch a portion of the program each day or to present the complete video, depending on your curriculum requirements.

The video *is* designed to simplify the complex. Concise wording and carefully selected graphics are used to provide maximum learning in minimum time. Close-up shots of components and service procedures are used to make every second of viewing instructional, as if each student was standing right behind you, watching over your shoulder while you were working or giving a demonstration.

Computer animation is used to explain difficult to comprehend principles or techniques. These images show how parts work, how they fit together, or how they vary in design.

QUIZ ANSWER KEY

1. c 2. d 3. c 4. a 5. b 6. a 7. d 8. b 9. a 10. d 11. c 12. c 13. a 14. d 15. c

Use your own judgement to evaluate the definitions, short answer questions and discussion topics.

TECHNICAL TERMS

Write definitions for the following terms. Use a textbook or review the video if needed.

automotive steering system
rack and pinion steering system
power steering hoses
power steering pump
steering wheel
manual rack and pinion steering
dry park test
steering input shaft
steering column universal joint
bellows
rack assembly mounting bushings
torsion bar seal
power steering belt
steering gearbox
pinion gear
long rack
easy-out
evacuating tool
hydraulic fittings
allen wrench
pitman arm
automobile road test
linkage type steering system
power steering fluid
steering stiffness
power rack and pinion steering
centre wear condition
rack and pinion gear assembly
tie rod ends
steering coupler
ball socket assemblies
torsion bar
power steering pressure test
hydraulic control valve
tie rod end separator
short rack
diagonal cutters
engine cradle bolts
power steering pump reservoir
torque wrench
centre link
steering column

VIDEO DISCUSSION TOPICS

Here are a few topics that might be used for a class discussion:

1. Why is it important to keep an automotive steering system in perfect condition?

2. Describe how a rack and pinion steering system operates.

3. What can happen if you overfill a power steering system with fluid?

4. Explain how a linkage type steering system works.

5. How can you check the operating condition of a power steering system with a stethoscope?

6. What type of problems should you look for when inspecting the condition of a linkage type steering system?

7. Name some of the methods used to troubleshoot an automotive steering system.

8. Why should you wear eye protection when testing a power steering system?

VIDEO QUIZ

Choose the most correct answer after reading the statement:

1. A _____ test will help you determine if problems exist other than the symptoms that are apparent to the customer.
   a. parking b. reverse c. road d. hydraulic

2. Missing or loose hose _____ and loose or worn belts are often the cause of steering related problems.
   a. pins b. nuts c. dampers d. clamps

3. If the customer complains of having to add _____ frequently to the power steering system, you know you have a leak somewhere that must be found.
   a. coolant b. water c. fluid d. grease

4. Power steering _____ sickness is caused by grooves being worn in the aluminium pinion housing by the hard, glass-filled seals around the control valves.
   a. morning b. hydraulic c. pinion d. rack

5. Centre wear condition is indicated by a slight _____ at high speeds while steering straight ahead.
   a. hesitation b. wandering c. leakage d. squeaking

6. When performing a dry park test, be sure the engine is _____ and keep the ignition unlocked so the steering wheel can move freely.
   a. off b. on c. warm d. hot

7. One of the most important reasons for _____ in the steering system is worn out tie rod ends.
   a. oil b. grease c. dirt d. play

8. What should be done if tie rod ends show signs of wear?
a. Nothing. b. Replace them. c. Take them to a machine shop. d. Place them in a vise and straighten them.

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VIDEO QUIZ (Continued)

9. Worn or damaged _____ seals are common symptoms of rack and pinion failure.
of rack and pinion failure.
a. internal b. ring c. cylinder d. steering

10. The best method of checking the condition of an inner ball socket assembly is to remove the _____ and perform a visual inspection.
a. grease b. oil c. hoses d. boot

11. If the rack assembly _____ bushings are in poor condition, the entire assembly will move in the mounts and cause sloppy steering and road wander.
a. hydraulic b. power c. mounting d. torque

12. With a _____gear power steering system, leaks can occur at the reservoir, hoses, lines, cover o-rings, gaskets and seals.
a. aluminium b. torque c. worm d. bevel

13. Power steering _____ pressure can exceed 1,000psi.
a. pump b. rack c. pinion d. linkage

14. A common trouble spot in a linkage type steering system is the _____ arm .
a. pressure b. torque c. pump d. idler

15. What should be done if a power steering pump fails the pressure test?
a. Adjust the power steering valve. b. Replace the pump pulley. c. Replace the pump. d. None of the above.

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SHORT ANSWER

Briefly answer the following questions in your own words:

1. Name some of the functions of an **automotive steering system.**

2. List the basic parts of a **linkage type steering system.**

3. Name the basic parts of a **rack and pinion steering system.**

4. Describe how to check the fluid level in a **power steering system.**

5. Why are ball sockets used in an **automotive steering system.**

6. What are some of the difference between a **rack and pinion steering system and** a **linkage type steering system.**

7. How can a **loose power steering belt affect steering system operation?**

8. Name some of the locations leakage can occur in a **power rack and pinion steering system.**

9. List the basic procedures used to remove a **power steering pump.**

10. How can trapped air in the system affect power steering operation?

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WE NEED YO UR HELP !

We are constantly trying to improve our videos. If you have any suggestions or comments, please send them to us with details (title, time code location, etc.) of any potential improvement. We will try to incorporate suggestions when revising our videos. Your help will be greatly appreciated. We want to help you train America's youth!

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